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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/916,935
Filing Date: July 27, 2001
Appellant(s): CASTELLI ET AL.

David W. Malloy

Attorney For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 24, 2006 appealing from the Office action mailed February 1, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

USPN 6,836,800	Sweet et al	12-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

New Matter

Claim 42 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the invention was filed, had possession of the claimed invention. In concept, the specification and drawings are silent on segmenting of variable length historic data, comparison of segmented historic data, comparison of unequal length of historic data and comparison of non-homogeneous type data.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. : While rejuvenating as related to software can be considered a binary operation (on/off), the applicant's use of the term related to uncertain data

creates uncertainty in the effect ... beneficial ... negative? The term "rejuvenating" is a relative term and renders the claim indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Sweet et al (U.S. Patent 6,836,800 referred to as **Sweet**).

Claim 1

Sweet anticipates monitoring, over a period of time, a contemporaneous resource utilization and a number of active devices to obtain monitored values of the contemporaneous resource utilization and the number of active devices (**Sweet**, c 1, l 12-45; c 2, l 5-20; Figs. 8-15); and predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices (**Sweet**, c 3, l 25-41; Examiner's Note (EN): the number of active devices is integrated into the system operation as shown in Fig. 1).

Claims 2, 15, 16

Sweet anticipates computing a regression model of prediction parameters on the member of active devices (**Sweet**, c 6, l 58-65; EN: as determined by the sample or example); constructing an empirical distribution of the number of active devices (**Sweet**, Fig. 8); and combining the regression model and the empirical distribution to produce a prediction model (**Sweet**, c 6, l 58-65; EN: μ - mean or average - and σ - standard deviation or measure of dispersion - define the model).

Claims 3, 17

Sweet anticipates step of combining the regression model and the empirical distribution comprises the step of computing, with respect to the empirical distribution, an expected value of each of one or more of the prediction parameters (**Sweet**, c 6, l 58-65; EN: μ - mean or average - and σ - standard deviation or measure of dispersion - define the model).

Claims 4, 18

Sweet anticipates for each of the one or more prediction parameters, for each of the monitored values of the number of active devices, computing confidence intervals for the one or more prediction parameters (**Sweet**, c 7, l 26-32); and selecting a corresponding one of the confidence intervals for the expected value of each of the one or more prediction parameters (**Sweet**, c 7, l 26-32; EN: such would be for the value of μ).

Claims 5, 19

Sweet anticipates computing confidence intervals for the prediction parameters, for each of the monitored values of the number of active devices (**Sweet**, c 7, l 26-32; c 8, 30-37 EN: such as a Cisco router); and combining the confidence intervals with the empirical distribution, to produce modified confidence intervals for the prediction parameters devices (**Sweet**, c 8, l 30-37).

Claim 6

Sweet anticipates the step of managing a resource capacity of the computer system, based upon the predicted subsequent resource utilization (**Sweet**, c 3, l 32-40).

Claim 7

Sweet anticipates the step of rejuvenating the computer software, based upon the predicted subsequent resource utilization (**Sweet**, c 3, l 32-40; EN: planned upgrades include software rejuvenation).

Claim 8

Sweet anticipates dynamically allocating at least one resource of the computer system, based upon the predicted subsequent resource utilization (**Sweet**, c 2, l 5-20; EN: adaptive changes achieve dynamic allocating).

Claim 9

Sweet anticipates identifying any of the plurality of devices that are relevant to a monitored resource (**Sweet**, c 2, l 5-34); and restricting at least one subsequent operation of the computer system that corresponds to the monitored resource to use

only devices identified as relevant to the monitored resource from among the plurality of devices (**Sweet**, c 2, l 5-34; EN: adaptive changes selects relevant devices).

Claims 10, 25

Sweet anticipates for a given device currently being evaluated for relevance to the monitored resource, computing a first regression model for the monitored resource on the member of active devices, based upon data acquired when the given device is active (**Sweet**, c 6, l 25-53; EN: such is a data sample); computing a second regression model for the monitored resource on the number of active devices, based upon data acquired when the given device is inactive (**Sweet**, c 6, l 25-53; EN: such is a second data sample); and comparing the first and the second regression models to determine whether the given device is relevant to the monitored resource (**Sweet**, c 6, l 25-53; EN: such would be the relationship between two sets of samples and the determination of covariance or correlation).

Claims 11, 26

Sweet anticipates the step of determining whether the first and the second regression models are statistically equivalent for a same number of active devices other than the given device (**Sweet**, c 6, l 46-53).

Claims 12, 27, 35

Sweet anticipates dividing the plurality of devices into device classes (**Sweet**, c 10, l 9-19); and counting the number of active devices in each of the device classes (**Sweet**, c 10, l 9-19; EN: map application contains the number of active devices).

Claims 13, 28

Sweet anticipates fitting a prediction model for a monitored resource, wherein prediction model of the prediction model depend on the number of active devices in each of the device classes (**Sweet**, c 10, l 9-19; EN: map application depends on network devices)).

Claims 14, 29

Sweet anticipates the step of computing a prediction model for the number of active devices in each of the device classes (**Sweet**, c 10, l 9-19; EN: such as the key network devices).

Claims 20, 30, 37

Sweet anticipates a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform said method steps (**Sweet**, c 3, l 25-40).

Claim 21

Sweet anticipates monitoring, over a period of time, resource utilization and a number of active devices to obtain monitored values of the resource utilization and the number of active devices (**Sweet**, c 2, l 5-20; Fig. 8-15); and identifying resource saturation, based upon the monitored values of the resource utilization and the number of active devices (**Sweet**, c 4, l 42-58; EN: signature detection establishes monitored values for the active devices).

Claim 22

Sweet anticipates identifying step comprises the steps of fitting a regression model of a monitored resource on the number of active devices (**Sweet**, c 6, l 58-65); detecting, in the regression model departures of the monitored resource from linearity (**Sweet**, c 6, l 58-65; EN: such would be the application of a Gaussian density function).

Claim 23

Sweet anticipates fitting a regression model of prediction parameters of the monitored resource on the number of active devices (**Sweet**, c 6, l 58-65); and detecting departures from linearity of the prediction parameters of the monitored resource (**Sweet**, c 6, l 58-65; EN: such would be the application of a Gaussian density function).

Claims 24, 36

Sweet anticipates identifying any of the plurality of devices that are relevant to a monitored resource (**Sweet**, c 2, l 5-20); and restricting at least one subsequent operation of the computer system that corresponds to the monitored resource to use only devices identified as relevant to the monitored resource from among the plurality of devices (**Sweet**, c 2, l 5-20; EN: such as are necessary to achieve automatic adaptation).

Claims 31, 38, 39, 40

Sweet anticipates monitoring, over a period of time, a resource utilization and a number of active devices to obtain monitored values of the resource utilization and the

number of active devices (**Sweet**, c 2, l 5-20; Fig. 8-15); and predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (**Sweet**, c 2, l 5-20; EN: such is automatic adaptation).

Claim 32

Sweet anticipates selecting a monitored resource (**Sweet**, c 2, l 5-20); and predicting the effects of adding the new device with respect to the selected monitored resource, based upon the monitored values of the resource utilization and the number of active devices (**Sweet**, c 2, l 5-20; EN: such is the function of automatic adaptation).

Claim 33

Sweet anticipates constructing a first prediction model of a distribution of the number of active devices (**Sweet**, c 2, l 5-20; EN: such as performance thresholds for the network); and modifying the first prediction model to produce a modified prediction model of the distribution of the number of active devices that accounts for the new device (**Sweet**, c 2, l 5-20; EN: such is the function of automatic adaptation).

Claim 34

Sweet anticipates computing a first prediction model for the selected monitored resource, based upon the first prediction model of the distribution of the number of active devices (**Sweet**, c 2, l 5-34; EN: such are application priorities); producing a first prediction of the selected monitored resource using the first prediction model for the selected monitored resource (**Sweet**, c 2, l 5-34; EN: such are application priorities); computing a modified prediction model for the selected monitored resource to account for the new device, based upon the modified prediction model of the distribution of the

number of active devices (**Sweet**, c 2, l 5-34; EN: such as automatic adaptation); producing a second prediction of the selected monitored resource, based upon the modified prediction model for the selected monitored resource (**Sweet**, c 2, l 5-34; EN: trade-offs); and comparing the first prediction and the second prediction of the selected monitored resource to evaluate the effects of adding the new device (**Sweet**, c 2, l 5-34; EN: trade-offs).

Claim 41

Sweet anticipates monitoring, over a period of time, a contemporaneous resource utilization and a number of active devices to obtain monitored values of the

contemporaneous resource utilization and the number of active devices (**Sweet**, c 1, l 12-45; c 2, l 5-20; Figs. 8-15); and predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices (**Sweet**, c 3, l 25-41; EN: para 11 applies; the number of active devices is integrated into the system operation as shown in Fig. 1); wherein said prediction step further comprises the steps of computing a regression model of prediction parameters on the member of active devices (**Sweet**, c 6, l 58-65; EN: as determined by the sample or example); constructing an empirical distribution of the number of active devices (**Sweet**, Fig. 8); and combining the regression model and the empirical distribution to produce a prediction model (**Sweet**, c 6, l 58-65; EN: μ and σ define the model).

(10) Response to Argument

Examiner's Opinion: The rejection of claim 42 regarding new matter is principally focused on a new structure that is not coherently evident in the text of the specification or in a specific flow diagram. One can always pick and reselect items to force fit a claim into the specification but that will frustrate one of ordinary skill in the art to replicate the invention without undue experimentation.

(a) In reference to Applicant's argument:

I. Claim 42 Complies With the Written Description Requirement of 35 U.S.C.§ 112, First Paragraph, and Does Not Contain New Subject Matter

The following is a quotation of the first paragraph of 35 U. S. C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

A. The Subject Matter of Claim 42 Is Contained Within The Specification

All of the subject matter of claim 42 was present in the specification as originally filed. Claim 42 recites, "A method for predicting a subsequent resource utilization (FIGS. 2-8, page 13, line 6 to page 22, line 4, FIG. 13, page 26, lines 7-22) in a computer system (FIG. 1, 101, page 10, lines 10-12) having a plurality of devices (page 1, lines 10-13), the plurality of devices comprising active devices and non-active devices (FIG. 14, page 27, line 16 to page 28, line 15), comprising the steps of: monitoring, over a period of time, a contemporaneous resource utilization to obtain first monitored values of the contemporaneous resource utilization (page 10, line 17 to page 12, line 7, page 13, lines 6-16); monitoring, over the period of time, a number of the active devices (page 10, lines 17-22) to obtain second monitored values of the number of the active devices (page 13, lines 6-16), wherein the monitored number is capable of varying over the period of time (page. 25, lines 13-20); monitoring, over the period of time, a type of each of the active devices to obtain third monitored values of the type of the each of the active devices (page 10, line 17 to page 12, line 7, page 13, lines 6-16); and predicting the subsequent resource utilization, based upon the first monitored values, the second monitored values, and the third monitored values (FIGs. 2-8, page 13, line 6 to page 22, line 4, FIG. 13, page 26, lines 7-22, FIG. 15, 1501, page 29, lines 7-13)."

B. The Deemed "New Subject Matter" Is Not Contained Within Claim 42

The basis for the Examiner's rejection is that the specification and drawings do not contain "segmenting of variable length historic data, comparison of segmented historic data, comparison of unequal length of historic data and comparison of non-homogeneous type data." As can be clearly seen from the text of claim 42 above, the subject matter the Examiner deems "new matter," such as "segmented historic data," is not recited in claim 42.

Thus, Applicant respectfully submits there is no new matter in claim 42 and believes there is no applicable rejection under 35 U.S.C. § 112, first paragraph, to claim 42. Accordingly, since there have been no other grounds of rejection regarding claim 42, Applicant respectfully requests that the rejection be withdrawn and that claim 42 be allowed.

Examiner's Response:

Claim 42 explicitly limits the result to "predicting the subsequent utilization, based upon the first monitored values, the second monitored values and the third monitored values. Page 14 of the specification at lines 8-10 cites: "Time series j produced by step 201 for a specific monitored resources contains the values of the monitored resource acquired at acquisition times where exactly j devices are active in the network. The time series values are the j series and since there is no segmentation of the j series

data, the concept of predicting the subsequent resource utilization based on a plurality of distinctly different values (first monitored values, second monitored values and third monitored values), is left as an exercise for one of ordinary skill in the art to determine. While the applicant has cited a structure on page 10 of the Appeal Brief at lines 6-22, such structure or road map that links the various sections of the specifications, suggested by the applicant, simply doesn't exist in the specification. If such structure actually existed in the specification, the applicant would have referenced page and line where such first monitored values, second monitored values and third monitored values explicitly existed. Further, applicant claims "predicting the subsequent resource utilization" which requires that somehow the various monitored values will be integrated. Fig. 15 of the specification described on page 29, lines 3-21 cites simultaneous sampling of resources of different classes, but specifically cites simultaneous resource use (specification, page 29, line 7-8) which is incongruent to a limitation requiring variation over a period of time.

Claim 42 as written cites simultaneous monitoring over a specific period of time such that three values of resources are obtained. The examiner believes that Fig. 15, specification page 29, lines 3-21 is about as close as the specification ventures in providing enablement to Claim 42. Review of the subject specification reveals that a vector J is established at each point in time which contains values for each device of a specific type. The time series is further described as dived into N sub series where each sub seried is characterized by a different value of the vector J. Such a process or model is at variance with the claim limitations cite different values over the same period

of time. Simply the specification teaches one vector J over one time period where claim 42 limits to three distinct values over one period of time. Simply, one of ordinary skill in the art would have to evolve a new invention to meet the limitations of claim 42.

The examiner's view of claim 42 relates to limitations requiring "segmenting of variable length historic data, comparison of segmented historic data, comparison of unequal length of historic data and comparison of non-homogeneous type data." To one of ordinary skill in the art, the invention relates to time series data (data in a file). The limitation of "over a period of time" relates to segmenting the data in a variable manner consistent with the period of time. The data is of a past type and hence is historic. The three monitoring limitation establish data comparison. Unequal length of historic data relates to the "monitored number is capable of varying over the period of time." Non-homogeneous type data is simply monitoring different active devices.

(b) In reference to Applicant's argument:

Examiner's Note: While rejuvenating as related to software can be considered a binary operation (on/off), the applicant's use of the term related to uncertain data creates uncertainty in the effect ... beneficial ... negative? Further, since rejuvenating as a limit on claim 1 would mean terminating operations at some undetermined time, such limitations would prevent the predicting limitations of claim 1 from being realized. This would result when rejuvenating takes place before all active devices are monitored.

II. Claim 7 Complies With The Written Description Requirement of 35 U.S.C.§ 112, Second Paragraph, and the Term "Rejuvenating" Is Not Indefinite.

A. The Term "Rejuvenating" Is Not a "Relative Term"

MPEP § 2173.05(b) relates to "relative terminology," which pertains to terms of degree and variable objects. The Examiner has incorrectly invoked this section of the MPEP by rejecting claim 7 under 35 U.S.C. § 112, second paragraph, because he deemed the term "rejuvenating" a "relative term" rendering the claim indefinite. Additionally, the Examiner did not provide a full explanation of the deficiency as required by MPEP 706.03(d). The Examiner merely stated that the term "rejuvenating" was a "relative term," without giving any support for the rejection, such as in what way the term was "relative." This rejection and its explanations are fundamentally flawed for several reasons.

A term of degree is a modifying word, for instance a word modifying an object by describing its extent, such as a "tall" or "heavy" object. A variable object is an object that can have indeterminate characteristics, such as "the height of the rider that the bicycle was designed for." "Rejuvenating" describes a process used as a method step and is not a term of degree or a variable object. "Rejuvenating" does not describe the extent of something and is not a reference to an object that is variable.

B. The Intent of a Claim Is Not Relevant

In a response to Applicant's arguments, the Examiner still did not give any support for his rejection that the term rejuvenating was "relative." Instead, the Examiner responded with a different alleged deficiency unrelated to relative terminology. Specifically, the Examiner stated, "Claim 1. teaches 'predicting subsequent resource utilization in a computer system' based on monitoring resources over time which requires computer system operation to realize the limitations. Rejuvenation or restarting of the software is a discontinuous operation and teaches away from the intent of claim 1 wherein resources are monitored over time ... a shutdown monitors nothing. Restarting means that all resource utilization returns to zero . . . stops. The intent of claim 1. is for continuous operation as indicated by 'monitoring over a period of time, a contemporaneous resource utilization.' The limitations of claim 7 are uncertain or indefinite to claim 1." Nowhere did the Examiner address anything related to the term "rejuvenating" being a relative term. However, the Examiner described new issues related to "teaching away" from the "intent" of a claim and the limitations of one claim being uncertain or indefinite to another claim. The new issues regarding teaching away from the intent of an element of a claim from which this claim depends are not deficiencies Applicant can find in the patent laws, regulations or MPEP.

The "intent" of a claim has no legal significance. The "intent" of a claim, even if significant, could not be defined by one of the claim elements. Whether or not claim 7 has an "intent" of a continuous operation, there is no "intent" for a perpetual operation. It is irrelevant whether the monitoring operation is continuous or discontinuous. A "period of time" has an end, occurring, for example, when a condition is met. Claim 7 describes an operation to be performed following the occurrence of a condition. Claim 7 is a further limitation to claim I and not necessarily a further limitation to the monitoring step of claim 1 as implied by the Examiner.

C. "Monitoring, over a period of time" Is Not Perpetual

"Monitoring, over a period of time" is not a perpetual operation but is performed for the period of time. The method of claim 1 provides method steps such that monitoring yields obtained results that prediction is based upon. In the case of claim 7, if the obtained results warrant, an additional step of rejuvenating the software occurs. It is irrelevant whether the monitoring operation is continuous or discontinuous. At some point in time, other method steps occur, whether or not monitoring continues to occur. Monitoring may be carried out by a system other than the computer system or software that is to be monitored and rejuvenated.

Also, the Examiner appears to be reading into claim 1 limitations that are not recited in claim 1 or limitations in the specification that would limit the scope of claim 1. The Examiner states that the word "monitoring" in one of the claim elements implies that the "intent" of claim 1 is that it be a continuous

operation and that the method step of rejuvenating the software in claim 7 is a discontinuous operation and "teaches away" from the "intent" of claim 1.

Additionally, the Examiner has equated rejuvenation with restarting and then restarting with system shutdown. Applicant does not disclose the discontinuous operation of system shutdown as Examiner has characterized rejuvenating. Applicant's disclosure does not use the word "shutdown" to describe rejuvenation. Furthermore, in the Advisory Action the Examiner asks how much rejuvenation is to be performed. Software rejuvenation is a discrete operation and not an operation that can be performed by percentages as indicated by the Examiner.

D. The Term "Rejuvenating" Is Previously Known

Software rejuvenation is described in commonly assigned U.S. Patent Application Ser. No. 09/706,737, filed Nov. 7, 2000, now U.S. Patent No. 6,993,458, entitled "Method and Apparatus for Preprocessing Technique for Forecasting in Capacity Management, Software Rejuvenation and Dynamic Resource Allocation Applications," the disclosure of which was incorporated by reference in the present application. Software rejuvenation, as recited in claim 7 and disclosed in the above reference, is described below.

> Software rejuvenation is a discipline concerned with scheduling the termination and re-initialization of applications or operating systems, in order to avoid catastrophic crashes. It is the mechanical equivalent of preventive maintenance. The assumption is that "bugs" in software might cause programs to allocate resources and never release them. Eventually, a crash is caused when the needed resource is exhausted. A typical example of this kind of "bug" is a memory leak, where an application allocates memory but mistakenly never releases it. Other resources that can be exhausted are semaphores, mutexes, handles etc.
>
> The motivation for rejuvenating software rather than waiting for a crash is twofold. A first reason is to prevent data loss and secondly to guarantee quality of service. For example, a crash of a database usually requires a rollback operation to a consistent state (reliably stored on persistent media during periodic checkpoint operations), the reconstruction of all the memory-based data structures, and the re-execution of all the transactions that have been committed after the most recent checkpoint, and have been stored in an appropriate log. The time required to recover from a catastrophic crash can be in the order of hours to tens of hours, during which the database is not available to process new transactions. Since the re-initialization of the database to a check pointed state is the least expensive of the above operations, it is beneficial to schedule the rejuvenation of the piece of software right after a checkpoint operation., possibly during a time of low utilization.
>
> In its simplest form, rejuvenation is based on static scheduling, where the application or the operating system is periodically restarted . ... If a resource is in danger of being exhausted in the near future, then the system administrator is notified of the problem and decides whether a rejuvenation should be appropriately scheduled .
>
> ...Then, using the prediction techniques, the software package can estimate the probability that a crash happens if a scheduled rejuvenation is not executed. If this probability is acceptably low, then the rejuvenation step is skipped.

As disclosed, rejuvenation does not require a shutdown of the computer system. The computer software may be restarted and re-initialized. Additionally, it is irrelevant whether there is a shutdown of the computer system since the method is not necessarily implemented by the same computer system or software as is monitored and rejuvenated.

Accordingly, claim 7 satisfies the requirements under 35 U.S.C § 112, second paragraph and Applicant respectfully requests withdrawal of the rejection.

Examiner's Response:

Applicant incorporated by reference USPN 6, 993,458 which discusses software rejuvenating starting at c1:63 and continuing through c3:40, concluding with the following paragraphs:

> Prediction in existing capacity management and rejuvenation systems is sensitive to the underlying assumptions described above. Data describing the overall behavior of large systems sometimes satisfies such assumptions. For example, the overall request traffic arriving at a very large web site (e. g., the Olympic web site) can be successfully analyzed using known techniques.
>
> However, in most scenarios, the data does not satisfy the assumptions, and the resulting prediction can be either erroneous, or can produce very wide confidence intervals. Hence, the usefulness of the prediction is significantly reduced.
>
> Additionally, often the data contains useful information that is not captured by the known types of decompositions. For example, changes over time of parameters of the different component processes, such as the increase of the variance of the non-deterministic component or a monitored quantity might be a powerful indicator of resource exhaustion, and would not be captured by the known decompositions, where the stationary assumptions implies that the non-deterministic component must have a fixed variance. Similarly, significant information is contained in certain characteristics of the monitored quantities, such as the presence, time behavior and amplitude of spikes or of jumps, which are hardly detectable from the known decompositions.

Claim 7 limits claim1 with the step of rejuvenating the computer software, based upon the predicted subsequent resource utilization. Rejuvenating, as discussed in USPN 6,993,458, and under the limits of claim 7, is relative since "the data does not satisfy the assumptions and the resulting prediction can be either erroneous, or can produce very wide confidence intervals and rejuvenating of the computer software is a

function of such uncertain data ... rejuvenating to the related data by applicant's own admission.

The relative nature of rejuvenating is defined by applicant's own reference. Rejuvenating certainly is a process that functions on relative or varying data. Applicant cited USPN 6,810,495 in the response dated November 7, 2005 where at c1:26-32 "software rejuvenation" is defined as follows:

> Software failures are now known to be a dominant source of system outages. One common form of software failure is due to "software aging" in which a resource, such as memory usage, is increasingly consumed and which eventually causes the system to fail. Preventing such aging by restarting the system (or subsystem) is known as "software rejuvenation."

Claim 1. teaches "predicting subsequent resource utilization in a computer system" based on monitoring resources over time which requires computer system operation to realize the limitations. Rejuvenation or restarting of the software is a discontinuous operation and teaches away from the intent of claim 1 wherein resources are monitored over time ... a shutdown monitors nothing. Restarting means that all resource utilization returns to zero ... stops. The intent of claim 1. is for continuous operation as indicated by "monitoring over a period of time, a contemporaneous resource utilization." Further, the limitations of claim 7 are based on uncertain or indefinite data and are further incongruous (don't fit) claim 1. Claim 1 identifies a computer system and the limitations of claim 7, relating to the computer system have an antecedent alignment ... claim 1 is attempting to predict subsequent resource utilization and claim7 can frustrate such limitation with an untimely activation.

(c) In reference to Applicant's argument:

Examiner's Opinion: The arguments that follow by the applicant generally state limitations of "identifying resource saturation, based upon monitored values of the resource utilization and the number of active devices" which applicant asserts that Sweet does not teach. Conversely, the prior art of Sweet entitled "Managing Computer Resources" anticipates the following:

- regarding monitoring values of the resource utilization. This is nothing more that collecting data on the operation of the system that includes various devices. Sweet at Fig. 1 identifies a network that includes various active devices and Sweet at Fig. 2 asserts that data is gathered about such computer network. Such collected data represents resource utilization.
- regarding identifying resource saturation. Sweet at c 2 l5-34 automatically adapts performance thresholds that lead to capacity upgrades. Capacity is of course synonymous with saturation and hence Sweet anticipates identifying resource saturation. Capacity upgrades would mean adding new devices to the system.

Further, Sweet at c 4 l 42-52 anticipates prediction or forecasting system performance (use of new devices and capacity limits or saturation) from signature detection software that process gathered data and establishes trending predictions from planning software.

III. The Teachings of Sweet, et al. Do Not Support the Anticipation Rejections

For a claim to be anticipated under 35 U.S.C. § 102, all elements of the claim must be found in a single prior art reference (see, e.g., Scripps Clinic & Research Found. V. Genentech, Inc., 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir_ 1991)). The identical invention

must be shown in as complete detail as is contained in the claim. (See MPEP ,§§' 2131). The single prior art reference must disclose all of the elements of the claimed invention functioning essentially in the same manner (see, e.g., Shanklin Corp. v. Springfield Photo Mount Corp, 521 F.2d 609 (1 s` Cir. 1975)).

Here, Applicant respectfully asserts that Sweet is legally deficient to establish a prima facie case of anticipation against any of claims 1-40. At the very least, Sweet does not anticipate independent claims 1, 21, 31, 38, 39 and 40, for the following reasons.

A. The Subject Matter Claimed In Each of Claims 1.-40, Taken As a Whole, Is Not Anticipated By Sweet, et al.

Claims 1-40 were rejected under 35 U.S.C. § 102(e), as being anticipated by Sweet, et al., U.S. Patent No. 6,836,800 (hereinafter, Sweet). Sweet is concerned with resource, management related to network traffic loads and anticipating network slow-downs, such as from software application response time. Nowhere is Sweet concerned with the addition of new devices or resources, such as Applicant's "subsequent resource utilization," or their prediction and effects.

Independent claims 1, 38, and 42 have limitations including "subsequent resource utilization" and Independent claims 31 and 40 have limitations including "adding a new device," which are directly related to new devices or resources on a computer system. Since Sweet does not disclose anything related to the addition of new devices or to subsequent resource utilization. Therefore, Sweet does not anticipate these claim limitations of independent claims 1, 31, 38, 40 and 42.

Further, Sweet discloses monitoring a number of network devices, computing statistics and displaying statistical information for selected key network devices. However, Sweet does not disclose "identifying resource saturation, based upon the monitored values of the resource utilization and the number of active devices," as recited in Applicant's independent claims 21. and 39. Therefore, Sweet does not anticipate independent claims 21 and 39.

In order for a reference to anticipate a claim, each and every element set forth in the claim must be found, either expressly or inherently, in the reference. Verdegaal Bros. V. Union Oil Co. of California, 814 F.2d 628,631, 2 USPQ2d 1051,1053 (Fed. Cir. 1987). The reference cited by the Examiner does not disclose, either expressly or inherently, each and every element of Applicant's Claims 1, 21, 31, 38, 39, 40, or 42. Therefore, the rejections under 35 U.S.C. § 102(e) should be reversed.

1. Sweet, et al. Does Not Anticipate Claim 1

The Examiner states that Sweet anticipates, inter alia, "predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices (Sweet, c 3, 125-41; Examiner's Note (EN): para 11 applies; the number of active devices is integrated into the system operation as shown in Fig. 1)."

Sweet discloses that "data is gathered about the network (step 1010), the gathered data is analyzed to determine whether a signature exists (step 1020), and if a signature exists, the signature is used for purposes such as generating alarms for unusual activity (or inactivity), reporting on the status of the network, and planning changes such as upgrades to the network (step 1030)." Sweet further discloses that "The signature detection software ... derives signature data 40 and other data 42 from the gathered data. The other data may include data needed for ... trending predictions." Sweet suggests that "trending" relates to "the capacity or configuration of the network."

However, Sweet does not disclose "predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices." Applicant respectfully submits that analyzing, data, generating alarms, reporting status and planning changes do not constitute or suggest "predicting the subsequent resource utilization." Furthermore, Applicant respectfully submits that trending predictions as disclosed by Sweet are predictions of network performance about the capacity or configuration of the network, and not "predicting the subsequent

resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices." Sweet indicates that the "other data" that may include data needed for trending predictions is derived from signature detection software and not from "contemporaneous resource utilization and the number of active devices." Accordingly, Claim 1 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

The title of the prior art of Sweet, USPN 6,836,800 is "Managing Computer Resources." Sweet teaches : Computer resources are managed by a method that includes deriving, from historical measured information for a computer resource, values for statistical variables, and based on the values, determining whether a behavioral pattern for the computer resource is represented in the historical measurement information (**Sweet**, Abstract). Concerning signature, Sweet teaches: "A signature is a statistically detectable pattern in measurement data" (**Sweet**, c2:55-56). Sweet also teaches: "The signature detection software includes statistical analysis software 38 that derives signature data 40 and other data 42 from the gathered data. The other data may include data needed for subsequent calculations, or data for statistical correlation or for trending predictions" (**Sweet**, c4:42-46). Further Sweet teaches: "Fig. 1 illustrates a system 10 for automatic signature detection and use on a network 12, such as the Internet or an intranet using Internet protocols, having network portions 14a-14c including computers 16a-16c, 18a-18c, and 20a-20c, respectively. In the network, router computers 21a-21c connect the network portions by interfaces 22a-22i to allow data traffic to flow among the network portions.

At least of one of the computers, such as computer 16b, runs data gathering software 24, signature detection software 26 and signature use software 28, so that

(Fig. 2) data is gathered about the network (step 1010), the gathered data is analyzed to determine whether a signature exists (step 1020), and if a signature exists, the signature is used for purposes such as generating alarms for unusual activity (or inactivity), reporting on the status of the network, and planning changes such as upgrades to the network (step 1030) (**Sweet**, c3:24-40). Planning is the effort that introduces addition of new devices. Reporting the status of the network includes identifying resource saturation especially with the introduction of alarms based on unusual activity where resource saturation would be such an example. Simply stated, trending predictions (Sweet, C4:46) are based on historic/current data and indicate what will be taking place in the future ... such is the applicant's "predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of the active devices."

(d) In reference to Applicant's argument:

2.. Sweet, et al. Does Not Anticipate Claim 21

The Examiner states that Sweet anticipates, inter alia, "identifying resource saturation, based upon the monitored values of the resource utilization and the number of active devices (Sweet, c 4, 1 42-58; EN: signature detection establishes monitored values for the active devices)." Furthermore, in the Examiner's response to Applicant's November 4, 2005 arguments regarding claim 21, the Examiner states that "'identifying resource saturation" is equivalent to an "alarm threshold" which Sweet teaches @ c 2:66.'

Sweet discloses "The signature detection software includes statistical analysis software 38 that derives signature data 40 and other data 42 from the gathered data. The other data may include data needed for subsequent calculations, or data for statistical correlation or for trending predictions." In the cited passage of the Examiner's response, Sweet discloses ". ..the signature may be used to establish an alarm threshold (i.e., an alert threshold) to allow a network manager to be alerted automatically to unusually high data traffic, due perhaps to a network malfunction or unauthorized use of the network..."

However, Sweet does not disclose "identifying resource saturation, based upon the monitored values of the resource utilization and the number of active devices."' Nor does Sweet disclose that the alarm threshold is related to "resource utilization and the number of active devices." "High data traffic," "network malfunction" or "unauthorized use" do not equate with "resource utilization and the number of

active devices." Accordingly, claim 21 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

As discussed above, Sweet teaches: "A signature is a statistically detectable pattern in measurement data" (**Sweet**, c2:55-56). Reaching a threshold means "identifying resource saturation" to which Sweet associates an alarm ... alarm threshold. Sweet's signature represents a pattern in measured data ... active devices in the network.

(e) In reference to Applicant's argument:

3. Sweet, et al. Does Not Anticipate Claim 31

The Examiner states that Sweet anticipates, inter alia, "predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, c 2, 1 5-20; EN: such is automatic adaptation)."

Sweet discloses"... resource usage can be tracked ... enabling highly meaningful analysis and presentation of information. In the case of a network, performance thresholds can be automatically adapted and kept current, ... Rich details of network traffic patterns can be . exposed and alert and alarm thresholds can be automatically tuned, allowing effective bandwidth management, capacity planning, and development of realistic service level expectations based on objective information."

However, Sweet does not disclose "predicting the effects of adding the new device with respect to the selected monitored resource, based upon the monitored values of the resource . utilization and the number of active devices." The Examiner equates Sweet's "performance thresholds can be automatically adapted" with Applicant's "predicting the effects of adding the new device." Applicant respectfully disagrees with the Examiner's apparent belief that "automatically adapting" is synonymous with "predicting the effects of adding the new device." In Sweet, automatically adapting refers to performance thresholds and not to "new devices." Accordingly, claim 31 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

As referenced above: "At least of one of the computers, such as computer 16b, runs data gathering software 24, signature detection software 26 and signature use software 28, so that (Fig. 2) data is gathered about the network (step 1010), the

gathered data is analyzed to determine whether a signature exists (step 1020), and if a signature exists, the signature is used for purposes such as generating alarms for unusual activity (or inactivity), reporting on the status of the network, and planning changes such as upgrades to the network (step 1030) (**Sweet**, c3:24-40)." When one plans an upgrade, one is "predicting the effects of adding the new device" which is based on monitored devices or resources to include numbers of active devices. Further, Sweet teaches "allowing network administrators to make ... capacity upgrades" (**Sweet**, c2:30) for new equipment. The automatic adaptation identifies saturation thresholds that lead to capacity upgrades.

(f) In reference to Applicant's argument:

4. Sweet, et al. Does Not Anticipate Claim 38

The Examiner states that Sweet anticipates, inter alia, "predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, c 2,15-20; EN: such is automatic adaptation)."

Sweet discloses "... resource usage can be tracked . . . enabling highly meaningful analysis and presentation of information. In the case of a network, performance thresholds can be automatically adapted and kept current, .. . Rich details of network traffic patterns can be exposed and alert and alarm thresholds can be automatically tuned, allowing effective bandwidth management, capacity planning, and development of realistic service level expectations based on objective information."

However, Sweet does not disclose "predicting the subsequent resource utilization, based upon the monitored values of the contemporaneous resource utilization and the number of active devices." The Examiner equates Sweet's "performance thresholds can be automatically adapted" with Applicant's "predicting the subsequent resource utilization." Applicant respectfully disagrees with the Examiner's apparent belief that "automatically adapting" is synonymous with "predicting the subsequent resource utilization." In Sweet, automatically adapting refers to performance thresholds and not to "subsequent resource utilization."

Additionally, the Examiner rejects claim 38 stating that Sweet discloses, inter alia, "predicting the effects of adding the new device," which does not apply to claim 38 since the limitation "predicting the effects of adding the new device" is not contained in claim 38. Accordingly, claim 38 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

Sweet addresses "trending predictions" (Sweet, c4:46), "capacity upgrades" (Sweet, c2:30) and "planning changes such as upgrades to the network (Sweet, c3:39). Sweet further addresses automatic adaptation that identifies saturation thresholds that led to capacity upgrades. For the record, the Examiner on page 9, lines 1-3 of the Final Office Action dated February 1, 2006 stated: "and predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, C2, l 5-20; EN: such is automatic adaptation)" which is appropriate.

(g) In reference to Applicant's argument:

5. Sweet, et al. Does Not Anticipate Claim 39

The Examiner states that Sweet anticipates, inter alia, "predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, c 2, 1 5-20; EN: such is automatic adaptation)."

Sweet discloses "... resource usage can be tracked ... enabling highly meaningful analysis and presentation of information. In the case of a network, performance thresholds can be automatically adapted and kept current, ... Rich details of network traffic patterns can be exposed and alert and alarm thresholds can be automatically tuned, allowing effective bandwidth management, capacity planning, and development of realistic service level expectations based on objective information."

However, Sweet does not disclose "a forecasting device for identifying resource saturation, based upon the monitored values of the resource utilization and the number of active devices." The Examiner equates Sweet's "performance thresholds can be automatically adapted" with Applicant's "forecasting device for identifying resource saturation." Applicant respectfully disagrees with the Examiner's apparent belief that "automatically adapting" is synonymous with "forecasting device for identifying resource saturation." In Sweet, automatically adapting refers to performance thresholds and not to "forecasting device for identifying resource saturation."

Additionally, the Examiner rejects claim 39 stating that Sweet discloses, inter alia, "predicting the effects of adding the new device," which does not apply to claim 39 since the limitation "predicting the effects of adding the new device" is not contained in claim 39. Accordingly, claim 39 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

Sweet addresses "trending predictions" (Sweet, c4:46), "capacity upgrades" (Sweet, c2:30) and "planning changes such as upgrades to the network (Sweet, c3:39). Sweet further addresses automatic adaptation that identifies saturation thresholds that led to capacity upgrades. For the record, the Examiner on page 9, lines 1-3 of the Final Office Action dated February 1, 2006 stated: "and predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, C2, l 5-20; EN: such is automatic adaptation)" which is appropriate to forecasting resource needs including saturation which is a range limit.

(h) In reference to Applicant's argument:

6. Sweet, et al. Does Not Anticipate Claim 40

The Examiner states that Sweet anticipates, inter alia, "predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices (Sweet, c 2, 1 5-20; EN: such is automatic adaptation)."

Sweet discloses ".. . resource usage can be tracked .. . enabling highly meaningful analysis and presentation of information. In the case of a network, performance thresholds can be automatically adapted and kept current, ... Rich details of network traffic patterns can be exposed and alert and alarm thresholds can be automatically tuned, allowing effective bandwidth management, capacity planning, and development of realistic service level expectations based on objective information."

However, Sweet does not disclose "a forecasting device for predicting the effects of adding the new device, based upon the monitored values of the resource utilization and the number of active devices." The Examiner equates Sweet's "performance thresholds can be automatically adapted" with Applicant's "predicting the effects of adding the new device." Applicant respectfully disagrees with the Examiner's apparent belief that '*automatically adapting" is synonymous with "predicting the effects of adding the new device." Automatically adapting refers to performance thresholds and not to "new devices." Accordingly, claim 40 is neither anticipated nor rendered obvious in light of Sweet and is allowable over the prior art of record.

Examiner's Response:

Sweet addresses "trending predictions" (Sweet, c4:46), "capacity upgrades" (Sweet, c2:30) and "planning changes such as upgrades to the network (Sweet, c3:39).

Sweet further addresses automatic adaptation that identifies saturation thresholds that led to capacity upgrades. Predicting the effects of adding a new device is part of a capacity upgrade since the new devices will provide greater capacity.

(i) In reference to Applicant's argument:

7. Sweet, et al. Does Not Anticipate Claims 2-20, 22-30 and 32-37

Since claims 2-20, 22-30 and 32-37 depend from independent claims 1, 21 and 31, respectively, they are allowable for at least the reasons given above for the independent claims.

Examiner's Response:

The related independent and dependent claims have been rejected based on the prior art of Sweet.

For reasons set forth above,

Respectively Submitted

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